



Climate resilient rainfed systems

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General Note



Article is recommended to print as color version in recycled paper. *Save Trees, Save Climate.*

Knowledge of potential impacts of climate change on agriculture is recently important aspects in scientific community. Many studies showed that climate change lead to agricultural vulnerability, which increases the problems of future food security. Rainfed agriculture covers 58% of net sown area in the country. It is the dominant contributor of staple food production and also ensures livelihood of majority of farmers in India. Climate variability may alter soil flora and fauna, the rate of soil organic matter (SOM) decomposition, nutrient cycling, soil moisture, as well as distribution of pests and diseases. The Intergovernmental Panel for Climate Change (IPCC) reported >25% decrease in food grain production due to climate change in India by 2030. A resilient agricultural system ensures better ecosystem services, such as food, feed, and livelihoods. Climate resilient agriculture, encompassing adaptation and mitigation strategies and the effective use of biodiversity is pre-requisite for sustainable development. Significant decline in production is likely to be caused by shortening of growing period, which will have negative impact on reproduction and grain filling particularly due to terminal heat stress and decreased water availability.

Some of the components towards climate resilience in rainfed systems include rain water management, new cultivars, integrated watershed development, conservation agriculture, and contingency crop planning and integrated farming systems. Management of soil, water and nutrient management strategies are highlighted as an important strategy in building the resilience of natural resources in rainfed areas. Development of climate-resilient crop varieties will be critical to agricultural adaptation. Therefore, there is an urgent need to promote indigenous crop varieties and reverse the loss of agro-biodiversity.

Large parts of India's drylands regularly suffer from water scarcity during summer and mid season droughts, exacerbated by the dropping water tables. Therefore, conservation of water either through increasing SOM or through development of watersheds or harvesting rainwater in the farm ponds is crucial to build resilience in agriculture. Farm ponds conserve the natural resources like soil and nutrients apart from water and acts as flood control measures by reducing peak flows in the watersheds or given area of catchment. Supplemental irrigation with harvested rainwater can play an important role in reducing the risk of crop failures. Conservation agriculture is an important system, it may conserves soil moisture by reduces evaporation and soil erosion, reducing runoff besides moderating soil temperature.

Success of integrated farming system (IFS) lies in proper enterprise mix and optimum utilization of resources. Increasing the tree component in IFS i.e. agroforestry, agri-horti, agri-silvipasture will sequester atmospheric carbon in the plant biomass and in the soil, thereby mitigating climate change. Under NICRA, technology demonstration components of several IFS modules with a combination of small enterprises such as crop, livestock, poultry, piggery, fish and duck rearing were demonstrated to farmers. Such systems improve their livelihoods and provide resilience to extreme weather events.